CHAPTER 2

Description of Alternatives, Including the Proposed Action

2.1 Proposed Action

The Innovative Wet Weather Program consists of numerous individual projects and activities at locations throughout the City of Portland. The IWWP will reduce the peak volume of stormwater entering the combined system and manage stormwater to reduce pollutant concentrations. Proposed projects are in five main categories:

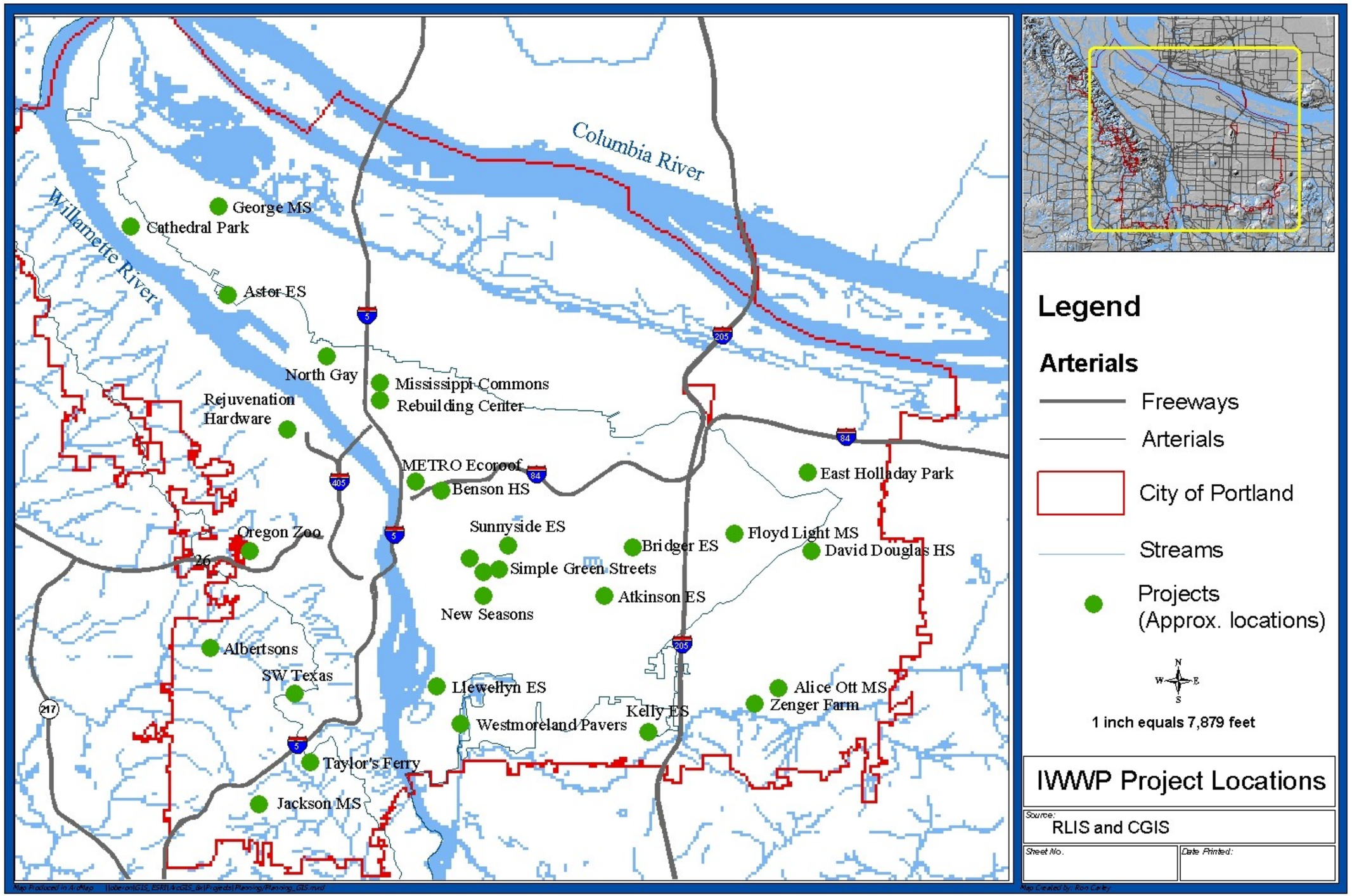
- Water quality-friendly streets and parking lots
- Downspout disconnections
- Eco-roofs
- Monitoring and feasibility studies
- Educational Efforts

A sixth funding category, grant and project management, provides for program and project management.

Most of the projects are targeted within the city's Combined Sewer Basin Boundary (see Figure 2.1-1, *City of Portland Watersheds and Basin Boundaries*). Some of the projects target the Separated Sanitary Sewer Area where peak inflows of stormwater into the storm sewer system need to be reduced. Many projects will be located in the public right-of-way and institutionally zoned parcels (such as streets and schools) owned by the City of Portland, Tri-Met, or other government agencies, while others will be sited on private property (commercial buildings, church parking lots, etc.) in cooperation with the property owners.

The IWWP consists of projects and activities in varying stages of development and design at the time of grant application. In some cases, the location and specific types of actions are reasonably well known or predictable. In others, the implementation locations and probable project elements are only known in general. Examples of more well-developed projects are included in the following descriptions of project categories and Table 2-1. In all cases, they would be consistent with the Portland *Stormwater Management Manual* (BES, 2002) and propose facilities that would provide multiple stormwater management benefits, including pollution reduction, peak flow and volume control.

The IWWP will be further refined as specific projects within each of the work categories are either implemented as outlined, removed from the list, or added as new projects. The selection of new projects would be based upon feasibility, opportunity, potential benefits, and existing


Columbia River
Willamette River
George MS
Cathedral Park
Astor ES
North Gay
Mississippi Commons
Rebuilding Center
Rejuvenation
Hardware
METRO Ecoroof
Benson HS
East Holladay Park
Oregon Zoo
Sunnyside ES
Bridger ES
Floyd Light MS
David Douglas HS
Simple Green Streets
New Seasons
Atkinson ES
Albertsons
SW Texas
Llewellyn ES
Alice Ott MS
Zenger Farm
Kelly ES
Westmoreland Pavers
Taylor's Ferry
Jackson MS
5
205
84
405
26
217
Legend
Arterials
Freeways
Arterials
City of Portland
Streams
Projects
(Approx. locations)
N
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1 inch equals 7,879 feet
IWWP Project Locations
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RLIS and CGIS
Sheet No.
Date Printed:
Map Created by: Ron Carley

priorities. However, in all cases, the probable environmental effects of projects would be predictable and describable within reasonably well-defined bounds. Any projects added would fit within the categories of projects described in this chapter and evaluated in Chapter 4 of this environmental assessment. None of the funded projects would be regulatory requirements or mitigation actions of other funded initiatives.

2.1.1 Water Quality-Friendly Streets and Parking Lots ("Green Streets")

Water quality-friendly streets and parking lots ("Green Streets") capture and detain rainwater in landscaped areas. The Portland *Stormwater Management Manual*, adopted July 1, 1999, and revised September 1, 2002, refers to these projects as stormwater-friendly street designs (BES, 2002). They manage stormwater as it sheet flows through swales and allow stormwater to infiltrate into the ground instead of being routed to the combined or separated sewer system. Typical design criteria include: Vegetated swales, Grassy swales, Vegetated filters, Planter boxes, Vegetated infiltration basins, Sand filters, Soakage trenches, Lowered Planter Strips, Porous pavement, Side Swales, and Trees. Examples of project details are illustrated in Figures 2.1.1-1 through 2.1.1-4. The water quality-friendly streets and parking lots projects are intended to do the following:

- Reduce CSO frequency and volume
- Reduce pollution entering the Willamette River and its tributaries, including Johnson Creek in southeast Portland, Tanner Creek in southwest Portland, and other west side creeks
- Increase vegetation in the city to help reduce heat island effects, provide habitat for wildlife and create green spaces for people

Porous pavement—pervious pavement or unit pavers on sand—would be used to facilitate stormwater infiltration in Green Streets. Depending on specific site conditions, the city typically uses shallow vegetated swales or vegetated areas on parking lots and streets to manage water quality and infiltrate stormwater. The stormwater management measures and facilities adhere to the Portland *Stormwater Management Manual*. The vegetated swales are shallow depressions that collect and infiltrate stormwater. The vegetated areas could include raised stormwater planters or landscaped islands at ground level with no depression. When combined with revegetation, projects would include upland plantings and natural treatment wetland construction. Natural areas would emphasize vegetation that is native to Portland (City of Portland, 1998). Typically, seed and plant materials are selected from 37 grass species, 15 shrub species, and 13 tree species to ensure diverse plant communities.

The water quality-friendly streets and parking lots projects would be sited primarily within the combined sewer basin boundary. Several potential and representative projects and sites have been identified, including the following:

TABLE 2-1. INNOVATIVE WET WEATHER PROGRAM PROJECTS CONDITIONALLY FUNDED, IN WHOLE OR IN PART, BY EPA GRANTS

Project Category	Description	Possible Locations
Water Quality-Friendly Streets And Parking Lots	Captures, detains, and manages stormwater runoff using surface infiltration systems such as porous pavement, swales, and sheet flow to landscaped areas	• N. Gay Avenue • Westmoreland Permeable Pavers • SE Division/New Seasons • SW Texas Avenue • Simple Green Street Side Swales • Cathedral Park • Oregon Zoo • Kelly Elementary School • East Holladay Park Porous Parking Lot • Zenger Farm • David Douglas School District Parking Lot Retrofits • Albertson's Parking Lot
Downspout Disconnections	Redirects stormwater runoff from roof drains to lawns, planter boxes, and gardens at commercial, industrial, and institutional properties	• Portland Public Schools • The Rebuilding Center • George Middle School Stormwater Planter • Mississippi Commons
Eco-Roofs	Captures and detains stormwater on roofs using soil and vegetation	• Rejuvenation Hardware Warehouse • Metro Eco-Roof • Others
Monitoring and Feasibility Studies	Monitors the effectiveness of best management practices (BMPs) in reducing pollution concentrations and the volume of stormwater runoff; conducts conceptual and preliminary engineering designs; monitoring projects will be limited to the amount of funds in this funding category	• Stormwater Infiltration Feasibility Studies • Other selected projects within the IWWP
Educational Efforts	Reduces CSOs volume and pollutant loading in streams by educating citizens to take action to reduce stormwater runoff	• City wide
Grant and Project Management	Ensures projects are completed on time, within budget, and according to the work scope and regulatory requirements; performs quarterly monitoring of program and project performance to EPA; directs matching city funds required by the EPA grant from the Tanner Creek Stream Diversion Project (Phase III)	• Program wide

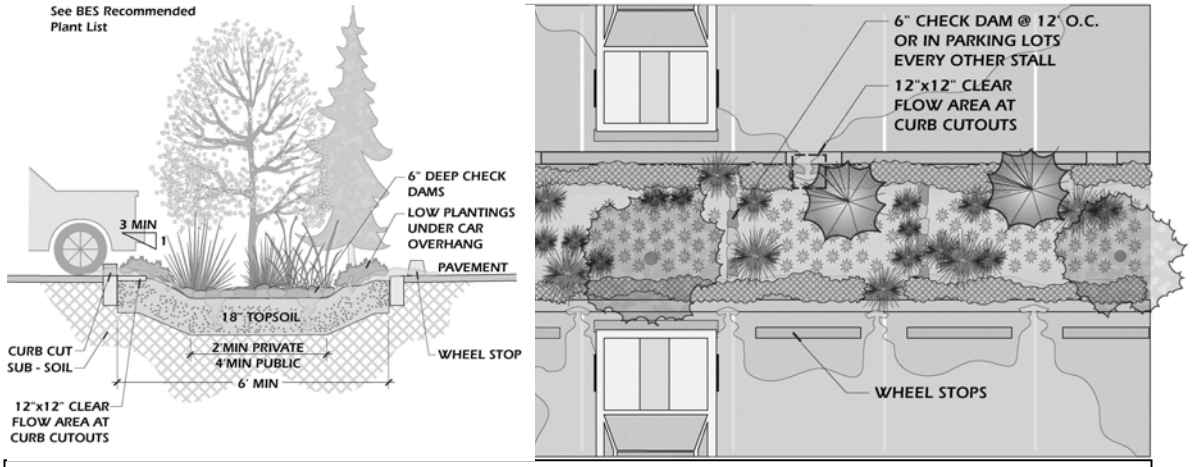

Figure 2.1.1-1. Typical section and plan of Vegetated Swale

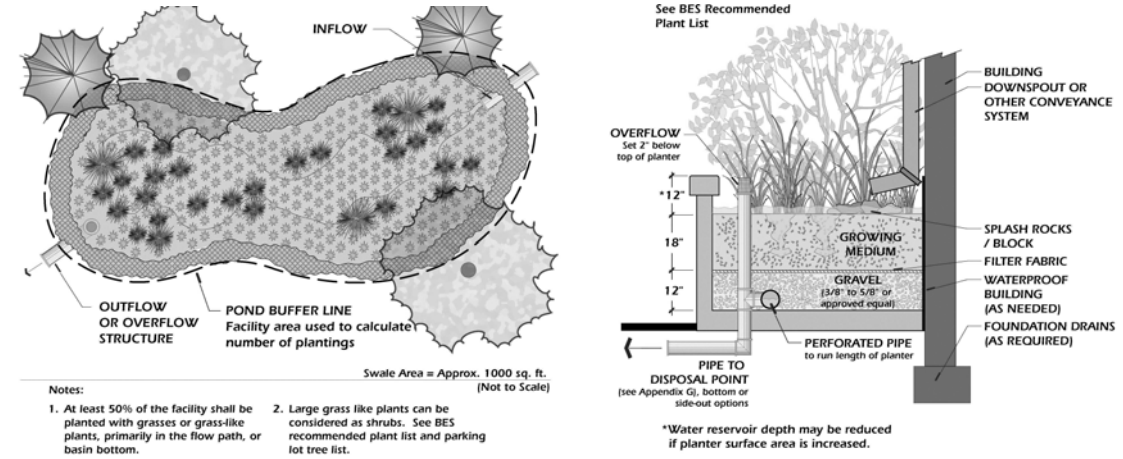

Figure 2.1.1-2. Plan of Vegetated Infiltration Basin and section of Planter Box

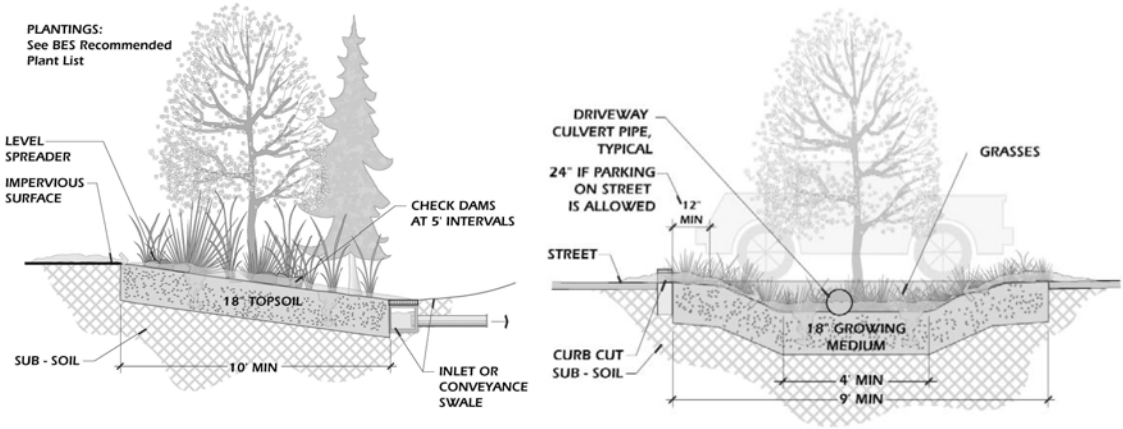

Figure 2.1.1-3. Typical sections of Vegetated Filter and Side Swale

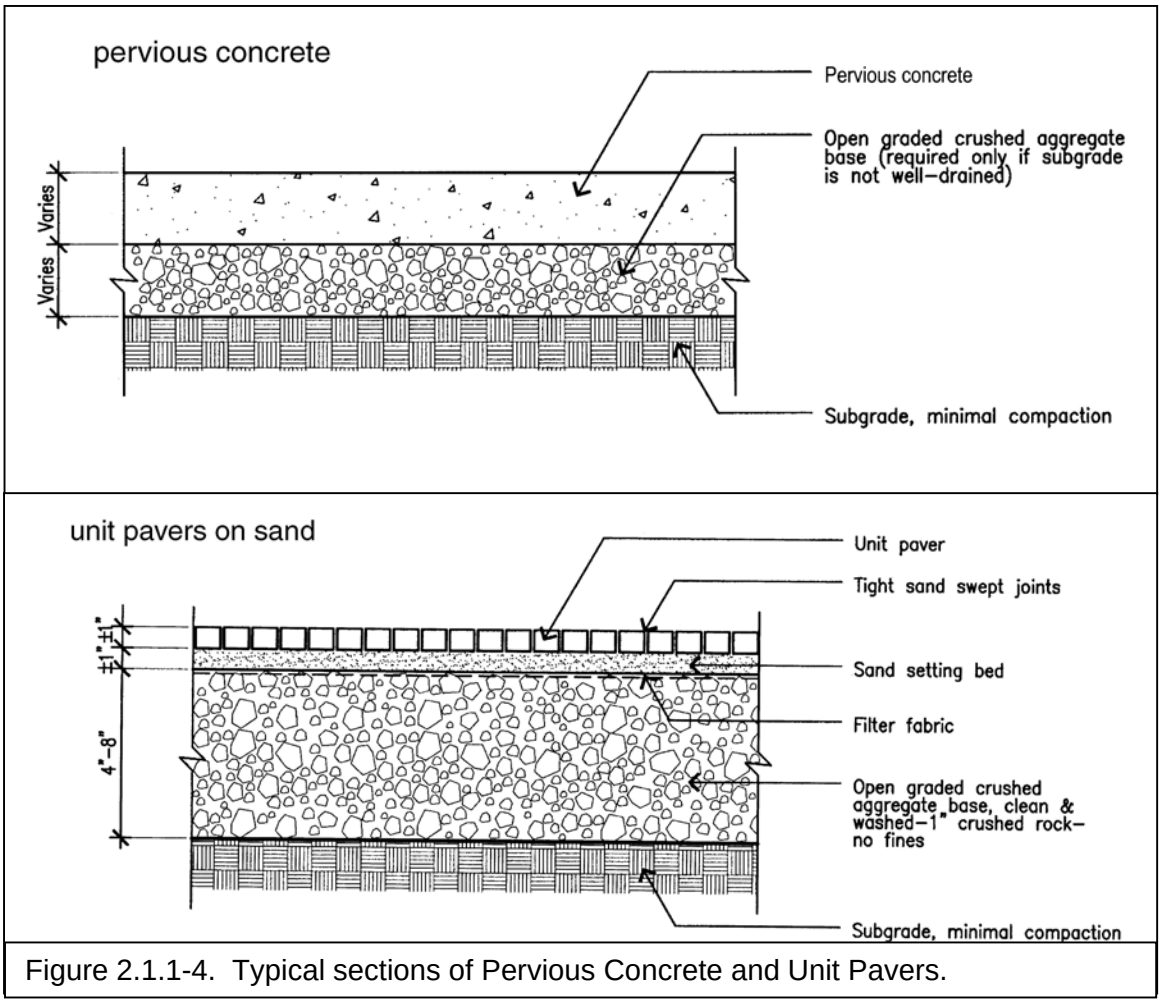

Figure 2.1.1-4. Typical sections of Pervious Concrete and Unit Pavers.

Green Street Projects

- ***North Gay Avenue***. This Green Street project demonstrates the use of porous pavement techniques. Four blocks, approximately one acre, of North Gay Avenue would be improved to satisfy current street standards and repaved using porous concrete, pavers, or other porous materials. The public street drainage would be retrofitted so that stormwater percolates through the pavement and into the ground. Two blocks would have full-width porous pavement, and two blocks would have porous pavement in the parking strips only. All of the stormwater from this surface would be removed from the combined sewer system for all storm events, which would amount to just less than 1 million gallons of stormwater each year. The pavement would be monitored for infiltration performance over time, constructability, durability, maintainability, and water quality. Results may be used to develop new city Green Street standards for urban streetscapes. $212,500 of IWWP funds has been budgeted for this project.
- ***Westmoreland Permeable Paver Project***. Existing asphalt/concrete residential streets would be removed throughout the three-block project and would be replaced with

permeable interlocking paving blocks designed to let stormwater soak through the street surface and into the ground. The paving would include:

- Curb-to-curb paving of the 2100 block of SE Knapp Street with permeable paver blocks; and
- Paving of SE 21st from Rex to Knapp plus the 2000 block of Rex as follows: a seven-foot-wide strip of paver blocks on each side of these streets in the curb lane, a 12-foot-wide asphalt lane in the middle of the street, and one-foot-wide concrete "dividers" between the pavers and the asphalt.

The permeable pavers look like bricks, but they are made out of high-strength concrete designed to withstand the stress of a residential street. The paving blocks have been used locally in parking lots and driveways, but not on a public street.

This project will provide an opportunity to observe how well the permeable blocks handle stormwater, and how well they stand up to the stress of residential street use. The pavement would be monitored for infiltration performance over time, constructability, durability, maintainability, and water quality. Results may be used to develop new city Green Street standards for urban streetscapes. $80,000 of IWWP funds has been budgeted for this project.

- ***SE Division/New Seasons***. This project has identified many different approaches to manage stormwater from SE Division and SE 20th streets and private property. Stormwater runoff from a portion of SE Division Street will be redirected, on the surface, into the landscape median between the sidewalk and street curb. On SE 20th street, stormwater runoff that would otherwise enter the combined sewer system will be captured within two stormwater curb extensions where it can be slowed, infiltrated, and cleansed. The New Seasons Market property hopes to achieve 100% on-site stormwater management by predominately surface stormwater conveyance into stormwater planters, parking lot swales, and a landscaped infiltration basin. $50,000 of IWWP funds has been budgeted for this project.
- ***SW Texas Avenue***. This project will incorporate a green street design using bioswales in the right-of-ways and a bio-retention pond. It treats 1.25 acres. It is a retrofit of an unimproved right of way, improving stormwater conveyance down Texas Street to a vacant lot, on both private and public property - street right of way and along the back side of a house (project co-sponsor). $77,000 of IWWP funds has been budgeted for this project.
- ***Simple Green Street Side Swale Projects***. BES will work with the city's Bureau of Maintenance (BOM) to do side swales when installing new or replacing old curb sections. Projects will likely include 3-4 blocks of side swales off a list of potential blocks (all blocks still need to be field verified and prioritized by BES and BOM). $20,000 of IWWP funds has been budgeted for this project.

Parking Lot Retrofits

- ***Cathedral Park***. Currently, stormwater from the 2.6-acre parking lot at Cathedral Park discharges directly to the Willamette River without treatment. Stormwater runoff would flow into a swale for water quality management and percolation into the ground. Some revegetation and slope bioengineering might be applied at the river, and vegetation maintenance (weeding, mulching, inter-planting, watering, litter and debris removal,

inspection of soil and repair eroded areas) would be performed to ensure success. $90,000 of IWWP funds has been budgeted for this project.

- ***Oregon Zoo***. Currently, stormwater runoff from the 67-acre campus and 4.8-acre parking lot at the Oregon Zoo discharges into the Tanner Creek combined system (see Section 2.1.4 of this EA). The project would retrofit facilities with designs from the *Stormwater Management Manual,* such as routing stormwater flow into vegetated flow-through planters for water quality management and detaining flow as previously described for parking lot retrofits. $225,000 of IWWP funds has been budgeted for this project.
- ***Kelly Elementary School***. Stormwater from parking lots and other impervious surfaces at Kelly Elementary School would be rerouted and discharged into swales and planting strips vegetated with native plants. Volunteers from the schools and surrounding communities, including students and adults, would participate in designing the swales and planting the vegetation. $25,000 has been budgeted for this project.
- ***East Holladay Park Porous Parking Lot Project***. This is a Portland Parks & Recreation parking lot project that includes a bioswale and pervious pavement for the entire 6,380 sf lot. Parks staff will seek complete on-site stormwater treatment, as well as extensive run-off reduction. The construction of a new parking lot is needed for the new dog off-leash area because the site lacks street frontage for parking. The bioswale will be sized according to the final size of the paved area, runoff calculations, and the infiltration potential of the soils. Plantings will be sized at installation to provide for parking lot screening. $45,000 of IWWP funds has been budgeted for this project.
- ***Zenger Farm***. There are four components to this project: 1) Stormwater Parking Area: Using Pervious Paving, Eco Pavers, Buffer Trees, and Planting areas to reduce urban heat island effect with drought tolerant and native trees, shrubs and ground covers; 2) Pedestrian Circulation: Using Pervious Concrete Walks; 3) Driveway: Using gravel paving for circulation beyond parking area to access the remainder of the farm, potential use of "Rainstore3" (or similar system) to capture and store water for landscape irrigation; and 4) Foster Rd. Improvements: New planting strip to accommodate new planting of drought tolerant and/or native trees and groundcovers. $50,000 of IWWP funds has been budgeted for this project.
- ***David Douglas School District Parking Lot Retrofit Projects***. To date, four schools have been identified as possible sites for disconnection work. Additional schools are being considered. Stormwater runoff would discharge onto lawns and vegetated areas. Projects are a combination of roof downspout disconnections, impervious area removal, and redirection of parking lot runoff. They currently include: 1) Alice Ott Middle School - Parking lot retrofit using curb cuts and asphalt berms to direct water to grassy areas; 2) Floyd Light Middle School - Parking lot retrofit using curb cuts and asphalt berms to direct water to landscape medians; 3) David Douglas High School - Parking lot retrofit using curb cuts and asphalt berms to direct water to landscape medians; 4) David Douglas District Offices - Parking lot retrofit using re-stripe, asphalt berms and curb cuts to direct water to landscape medians. $30,000 of IWWP funds has been budgeted for this project.
- ***Albertson's Parking Lot Retrofit***. BES has worked with Albertson's in the past on a revegetation project along Fanno Creek which is adjacent to their store and parking lot. This

project would address pollutants coming from the parking lot into Fanno. Since the lot slopes toward the creek and the property includes an unpaved picnic area along the creek, a swale could be sited below the lot or include removal of asphalt in the lot. More than 10,000 square-feet of the Parking lot will be treated by this project. $20,000 of IWWP funds has been budgeted for this project.

Revegetation

Typical revegetation projects involve planting trees in parking strips along streets and parking lots. Trees intercept rain, reducing the amount of stormwater entering the combined sewer system or the amount discharged directly to receiving streams. Generally, each tree captures and evaporates at least 35 percent of the rain that falls on it, which amounts to about 12 inches per year. Revegetation would be performed where improvements are needed in the volume and timing of stormwater entering the sewer system or where there is opportunity to improve sites with local partners. The revegetation projects would involve clearing undesirable vegetation, soil preparation, planting, seeding, mulching, erosion control, and vegetation maintenance during the plant establishment period. $40,000 of IWWP funds has been budgeted for these projects.

2.1.2 Downspout Disconnections

Under these projects, roof drains from commercial and institutional buildings would be disconnected and redirected onto lawns and planter boxes. Possibly some residential disconnections may be completed, but the focus would be on commercial and industrial buildings due to the shear volume of stormwater coming from these sites. Engineering evaluation would determine how stormwater flows from large roof areas to the ground and how the runoff can be directed over the ground to a single point for treatment and discharge, or infiltration. (Some of the schools may discharge the stormwater using pipes that are inside the buildings.) They manage stormwater as it sheet flows through swales and allow stormwater to infiltrate into the ground instead of being routed to the combined or separated sewer system. Typical design criteria from the *Stormwater Management Manual* (BES, 2002) include: Vegetated swales, Vegetated filters, and Vegetated basins. Examples of project-specific aspects include redirection of overland flow to accommodate these additional flows, construction of catch basins and stormwater collection pipelines, stormwater bioswales, and best management practices for erosion control (Figure 2.1.2-1). Also, each project includes design and construction of landscaping that is appropriate for sites that could have high volumes of stormwater in winter but be completely dry in summer.

The downspout disconnection projects are intended to: (1) reduce CSOs into the Willamette River, which would reduce the quantity of bacteria in the river; (2) reduce the volume of stormwater flowing directly to receiving streams; and (3) enhance upland habitat areas. These projects also result in increased vegetation in the city, which helps reduce the urban heat island effect and provides habitat and some green space. Potential project sites include the following:

- ***Portland Public Schools***. To date, six schools have been identified as possible sites for disconnection work. Additional schools are being considered. Stormwater runoff would discharge onto lawns and vegetated areas instead of into the storm or combined sewer systems. Projects are a combination of roof downspout disconnections, impervious area removal, and redirection of playground runoff. They currently include: 1) Bridger

Elementary School - Downspouts will be disconnected to stormwater planters and paved play areas will be removed for landscape infiltration; 2) Benson High School - Install a series of above ground stormwater planters to manage stormwater runoff from the F-wing and half of the C-Wing of the Benson High School building complex. These planters would be located within a central courtyard that is already being redesigned to provide for a porous surface; 3) Llewellyn Elementary School - Install stormwater treatment swales within the planting strip areas on SE 14th street and on the backside of the school; 4) Sunnyside School - Removal of impervious area in the locked northern courtyard. There is space and ample downspout opportunities to disconnect into the newly exposed soil area, disconnect two downspouts into a swale on the western side of the building, and remove partial or full concrete slabs in the playground area. There is a radials board design in the concrete play area to the north of the school. There is an opportunity to remove the wooden expansion joints and replace them with gravel, remove a swath of the southern portion of the concrete to create an infiltration trench or to remove the entire concrete area; 5) Atkinson Elementary School - Downspout disconnection on the northern part of the school building and pavement removal throughout the playgrounds south of the school; 6) Astor Elementary School - Pavement removal and installation of a swale on the east courtyard. $60,000 of IWWP funds has been budgeted for these projects.

- ***The Rebuilding Center***. Downspouts will be disconnected to stormwater planters, specifically: Two infiltration planter boxes covering a total of 1,206sf to manage roof runoff from a new building (Michigan Canopy) with coverage of 17,685sf; Two infiltration planter boxes covering 345sf and one flow-through planter box covering 359sf to manage roof runoff from a new building (Mississippi Canopy) with coverage of 13,300sf. $45,000 of IWWP funds has been budgeted for this project.
- ***George Middle School Stormwater Planter***. The George Middle School Stormwater Planter Project is a retrofit of an existing planter box in front of the main entrance to the school. The L-shaped planter box is approximately 690sf. One connected downspout that drains approximately 4,000sf of the roof is located in the northeast corner of the planter bed. Opportunity exists to retrofit the existing planter to create a flow-through stormwater planter box. $15,000 of IWWP funds has been budgeted for this project.
- ***Mississippi Commons***. This is a mixed-use redevelopment project utilizing an internal "rain drain" system that will collect stormwater from over 20,000sf of roof area (that is currently connected to the city system) and sent to a courtyard swale. The swale is designed as an architectural feature for this buildings public space. $25,000 of IWWP funds has been budgeted for this project.

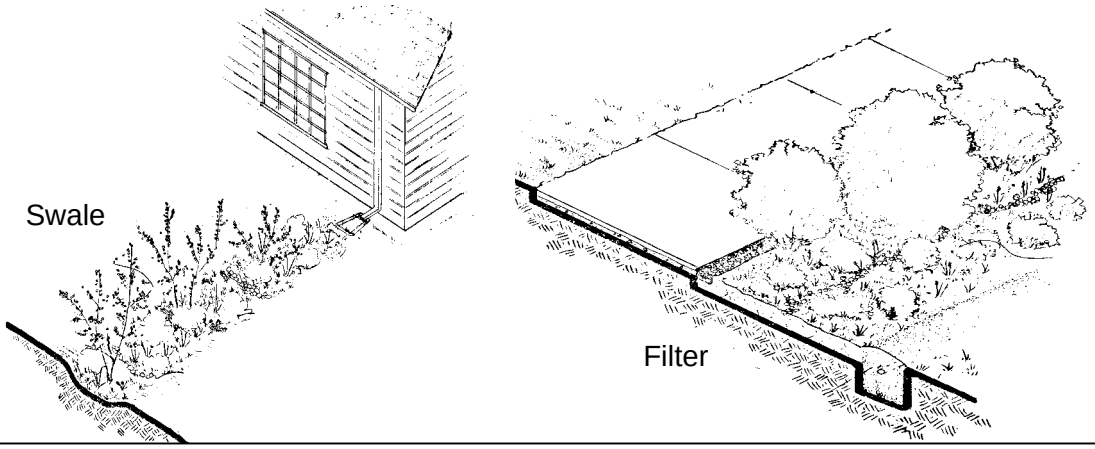

Figure 2.1.2-1. Downspout disconnections with Vegetated Swale and Filter

2.1.3 Ecoroofs

Ecoroofs would be constructed to detain stormwater runoff and reduce the amount of stormwater delivered to the sewer system. The intent is to reduce CSOs into the Willamette River and stormwater flows into receiving streams. These innovative roof designs are composed of an impermeable membrane covered with soil and vegetation instead of conventional roofing materials such as asphalt or wood shingles. Typical design criteria from the *Stormwater Management Manual* (BES, 2002) include: Ecoroof and Roof Garden (see Figures 2.1.3-1 and 2.1.3-2). The soil and vegetation hold the stormwater and return a significant amount directly to the atmosphere through evapotranspiration. The roofs detain about 30 percent of the annual precipitation that falls on them. By detaining stormwater, eco-roofs reduce peak flows in the sewer system. In addition, ecoroof projects in Portland provide educational opportunities regarding stormwater for students, parents, business owners, and the broader Portland community. A proposed ecoroof site is an example of a private project opportunity:

- ***Rejuvenation Hardware Warehouse***. An existing commercial building with a 50,000-square-foot roof would be retrofitted with an ecoroof. A predesign would need to be completed on this project to determine hydrological performance. The design may include stormwater planters and downspout disconnection (see Section 2.1.2 of this EA). The privately owned Rejuvenation Hardware Warehouse is located in a highly developed industrial area and would provide an educational opportunity for other business owners in a particularly impervious area of the city. $85,000 of IWWP funds has been budgeted for this project.
- ***Metro Ecoroof***. This retrofit project will transform 2,500sf of the 3rd floor rooftop from a ballasted roofing system to a vegetated rooftop. Metro is a public facility. If the pilot is successful, Metro would consider expanding the ecoroof at such future time as it replaces the current roof membrane. $35,000 of IWWP funds has been budgeted for this project.

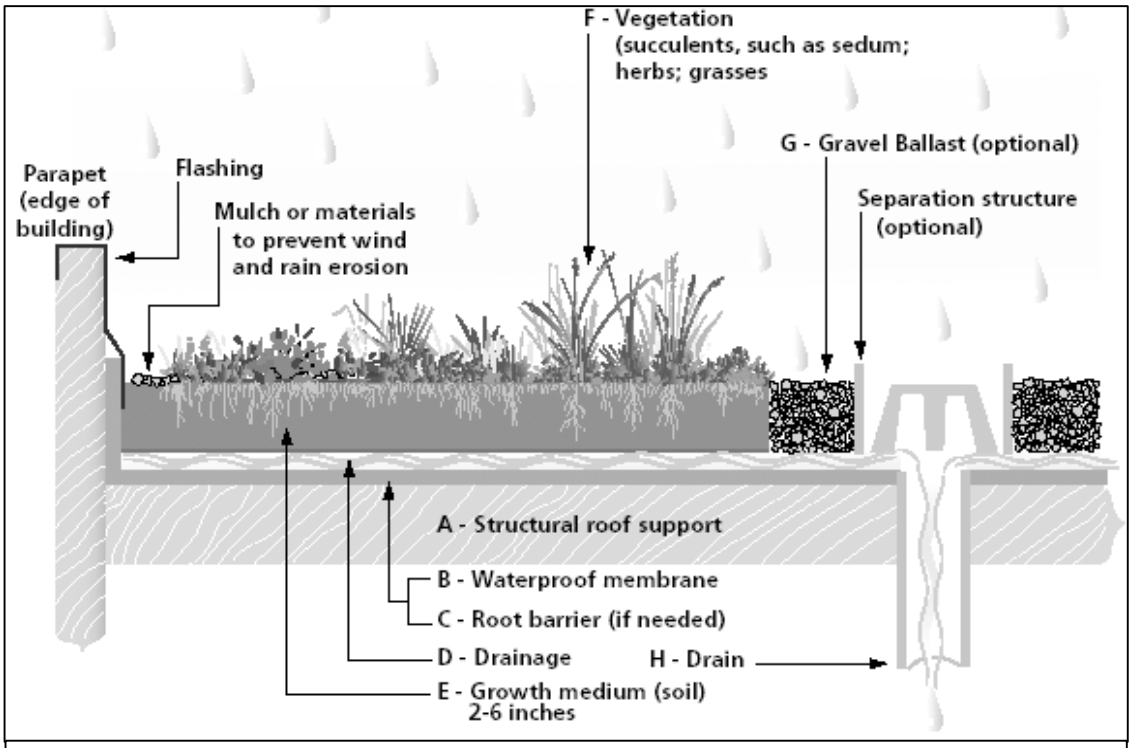

Figure 2.1.3-1. Typical Eco-Roof diagram

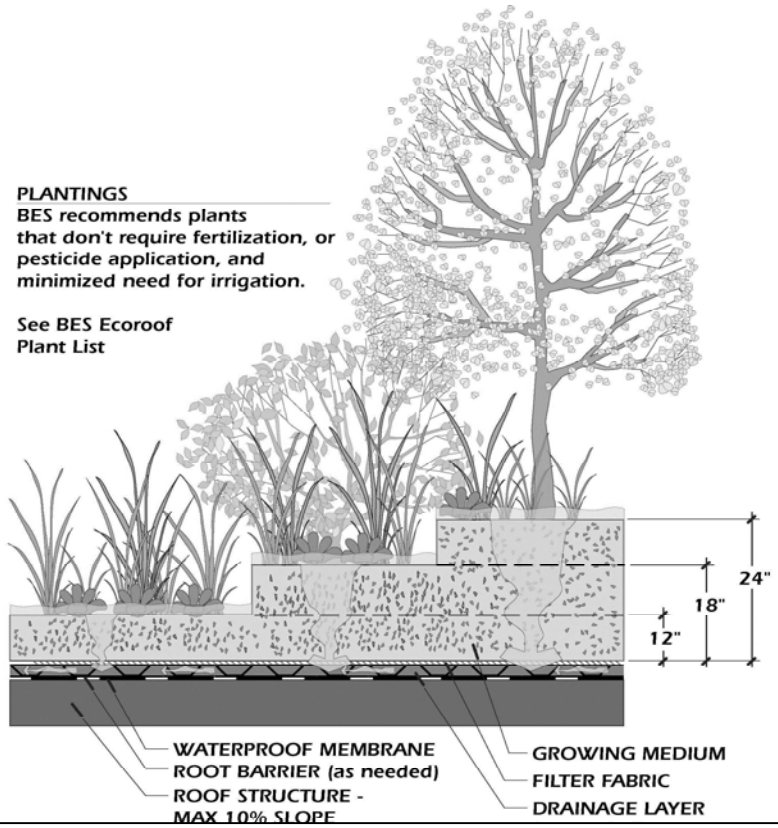

Figure 2.1.3-2. Typical section of Roof Garden

2.1.4 Monitoring and Feasibility Studies

Monitoring and feasibility studies help to ensure that innovative IWWP projects are successful. However, funds in this category would not be used to construct individual projects. Some examples of monitoring and feasibility studies are as follows:

Monitoring. The IWWP projects and other IWWP-type projects promote new technologies, especially in commercial, industrial, and institutional settings. Many are intended to be demonstration projects or provide a basis for continual improvement in approaches to urban stormwater management. Thus, it is desirable to obtain data on program successes and areas for improvement and to share and use the data in other settings within and outside Portland.

The objectives of monitoring projects are as follows:

- Focus on IWWP action-oriented construction projects (Green Streets, downspout disconnections, and eco-roofs), and non-program projects using similar technologies, to determine the performance and effectiveness of stormwater best management practices (BMPs)
- Assess the contribution that innovative technologies make to controlling flows, and reducing stormwater pollution, the volume of stormwater runoff, and CSOs
- Provide data to inform others about the success of using these types of technologies to reduce CSOs and improve watershed health
- Assess maintenance and implementation issues
- Provide data for quarterly program monitoring reports that will be submitted to EPA

Monitoring would help to ensure that innovative IWWP projects are successful, and to assess the contribution that IWWP solutions make to controlling flows, reducing pollution and CSOs, and improving watershed health. Monitoring projects would address key policy and technology questions that arise during program implementation. Monitoring projects would be limited to the amount of funds available in the Monitoring and Feasibility Studies funding category.

At the level of program monitoring, the IWWP would submit quarterly reports to EPA on the status of funded projects. At the individual project and technology levels, representative designs, facilities, and BMPs from each action-oriented construction project category would be subsampled for use as indicators of effectiveness toward meeting the goals of the IWWP.

IWWP monitoring will provide a basis for continual improvement in approaches to urban stormwater management. For example, future revisions to the Portland *Stormwater Management Manual* (BES, 2002) will benefit from monitoring IWWP projects.

Specific monitoring projects have not yet been designed; rather, they would be developed to address key policy and technology questions that arise during program implementation. Water quality compliance monitoring will not be funded by the EPA grant. $100,000 of IWWP funds has been budgeted for this project.

Stormwater Infiltration Feasibility Study. Generally, feasibility studies are used for the purposes of developing conceptual plans and conducting preliminary engineering.

At some sites stormwater disposal is very complex. This is particularly true in dense urban areas. Stormwater infiltration feasibility studies examine areas of the city to determine whether

innovative stormwater management approaches can provide flow control and reduce stormwater pollution. One example of a feasibility study is Centennial Mills, which is a large, publicly owned building on the bank of the Willamette River. Site and location constraints pose challenges for stormwater infiltration at Centennial Mills. Other sites might be addressed in feasibility studies, and all would have unique constraints such as contaminated soils or limited land available for infiltrating stormwater. $45,000 of IWWP funds has been budgeted for this project.

2.1.6 Educational Efforts

Educational materials provide a tremendous opportunity to further leverage on-the-ground projects addressing problems associated with stormwater. The number of property owners interested in doing their own work to minimize impact to their watershed would increase through the creation of materials providing background information on particular projects and methods used to reduce the amount of stormwater entering the system. Potential educational projects include interpretive signs at project sites, videos and displays, workshops, and printed materials such as brochures and maps**.** Many efforts would involve citizens in protecting and enhancing their local watersheds. Education projects are intended to further reduce CSOs entering the Willamette River by active public participation in managing their stormwater. $65,000 of IWWP funds has been budgeted for this project.

2.1.7 Grant and Project Management

A sixth funding category, grant and project management, is assigned to ensure compliance with federal grant and procurement requirements. However, EPA funds in this category would not be used to design or construct individual projects.

A city staff member would be the grant manager and also manage many of the individual tasks and projects. The grant manager is the primary point of contact for the City of Portland on the federal grant. Existing city staff, primarily engineers, landscape architects, outreach specialists, project managers, and construction managers, would work on the IWWP projects and charge authorized time and local travel costs on grant-funded projects to the grant. City staff would hire a consultant to conduct monitoring and feasibility studies (see section 2.1.4 above).

The grant manager performs quarterly monitoring of IWWP program and project performance to EPA. $150,000 of IWWP funds has been budgeted for grant and project management.

Budget. Table 2-2 provides a summary budget for the IWWP. This budget is based upon EPA grant awards to the IWWP for FY2002 and FY2003 amounting to $1,649,000. Additional federal grants for similar project types are expected. City of Portland Capital Improvement Project matching funds will amount to $1,350,000 for these first two EPA grants. Additional matching funds will be identified when future grants are awarded.

The IWWP consists of projects and activities in varying stages of development and design at the time of grant application and EA submission. Project details, including IWWP funds budgeted for each project, are presented as known at this time. EPA will be notified prior to finalizing decisions on each of the projects and be given the opportunity to provide input.

TABLE 2-2. INNOVATIVE WET WEATHER PROGRAM SUMMARY BUDGET

Projects	EPA IWWP Funds	City Matching Funds
▪ **Water Quality-Friendly Streets and Parking Lots**		
Green Street Projects		
North Gay Avenue	$212,500	
Westmoreland Permeable Pavers	$80,000	
SE Division/New Seasons	$50,000	
SW Texas Avenue	$77,000	
Simple Green Street Side Swales	$20,000	
Parking Lot Retrofits		
Cathedral Park	$90,000	
Oregon Zoo	$225,000	
Kelley Elementary School	$25,000	
East Holladay Park	$45,000	
Zenger Farm	$50,000	
David Douglas School District Parking Lot Retrofit Projects	$30,000	
Albertson's Parking Lot Retrofit	$20,000	
Revegetation	$40,000	
▪ **Downspout Disconnections**		
Portland Public Schools	$60,000	
The Rebuilding Center	$45,000	
George Middle School Stormwater Planter	$15,000	
Mississippi Commons	$25,000	
▪ **Ecoroofs**		
Rejuvenation Hardware Warehouse	$85,000	
Metro Ecoroof	$35,000	
▪ **Monitoring and Feasibility Studies**		
Monitoring	$100,000	
Stormwater Infiltration Feasibility Studies	$45,000	
▪ **Educational Efforts**	$65,000	
▪ **Grant and Project Management**	$150,000	
Match Project – Tanner Phase 3		$1,350,000
▪ **Contingency/Unidentified Projects**	$59,500	
Total	$1,649,000	$1,350,000

Match Project. The IWWP selected the Tanner Creek Stream Diversion Project (Phase III) as its EPA match project. The Tanner Creek Stream Diversion Project is one of the projects developed for managing CSOs to the Willamette River, and incorporates many features for improving water quality and quantity. City of Portland Capital Improvement Project matching funds will amount to $1.35 million for these first two EPA grants. No EPA grant funds would be spent on this match project.

The project was identified in the *Combined Sewer Overflow Management Plan (Final Facilities Plan)* (City of Portland, 1994) to remove a large volume of stormwater from the combined sewer system. Tanner Creek historically flowed naturally through Portland's northwest hills. Phase 3 begins near the Oregon Zoo, separates the storm flows that drain to the Sunset Highway corridor, and ends near SW Jefferson Street where it joins prior separation projects. Separation is accomplished by restoring and rerouting stormwater and the stream, which has been put into the sewer system. Separating the stormwater from the combined sewer system would reduce CSOs from the system and avoid the costs of conveying and treating stormwater at a wastewater treatment plant. CSO events contribute bacteria, floating solids, and biological oxygen demand that negatively affect water quality.

The Tanner Creek Stream Diversion Project collects treated stormwater from the upper reaches of the watershed and pipes it separately to the Willamette River. The drainage area that the storm-only system would serve is approximately 730 acres. The Oregon Zoo parking lot retrofit is one of several related projects that would detain and cleanse stormwater close to its source in the upper watershed (see Section 2.1.1 of this EA). Other facets of the Tanner Creek Stream Diversion Project may include:

- Slope bioengineering to control soil and stream channel erosion and sediment delivery to Tanner Creek from uplands. These activities would increase surface roughness and delay surface stormwater runoff.
- Upgrading of existing stormwater systems to reduce local flooding problems in basements and streets.
- Spill control facilities to control unintended discharges along Highway 26.
- Interbasin transfer of stormwater from the Montgomery system to the Tanner Creek system to match the amount of stormwater in a basin with the capacity of the storm sewer to convey it. Interbasin stormwater transfer would alleviate street and basement flooding issues in susceptible neighborhoods, allowing more opportunities for IWWP projects. For example, innovative wet weather projects cannot be implemented at the Market and 17th Subbasin (Montgomery neighborhood) because the existing storm sewer is at capacity. Interbasin transfer of some of that subbasin's storm flows to Tanner Creek Stream Diversion Project Phase 3 frees up conveyance capacity and enables neighborhood downspout disconnections and eco-roof projects to move forward.

The design for Tanner Creek Phase 3 is currently at 60 percent of completion. There already has been extensive public involvement on this match project. The project is described in detail in the *Tanner Creek Basin Environmental Assessment* (City of Portland, 1997). The environmental effects of the city's match project were determined to be not significant.

2.2 No Action Alternative

Under the No Action Alternative, the EPA would not fund the IWWP and the city would not conduct the actions established for the IWWP during the next few years. Projects falling into the five categories—water quality-friendly streets and parking lots, downspout disconnections, eco-roofs, monitoring and feasibility studies, and educational efforts—would not be funded, nor would grant and project management. Consequently, CSOs would continue unaffected by these projects. Furthermore, no data or new knowledge would be generated about the effectiveness of IWWP projects, and fewer people would be educated about the water quality benefits of the IWWP projects and technologies. Eventually, IWWP-type projects will occur regardless of EPA funding because of the water quality benefits they provide. However, the increased probability that construction projects will be implemented, and the ability to accelerate the implementation schedule, will not occur without the funding decision.